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EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS ON THE PEDLAR RANGER DISTRICT, GEORGE WASHINGTON NATIONAL FOREST, VIRGINIA

By

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INTRODUCTION

Aerial and ground southern pine beetle evaluation surveys were conducted on the Pedlar Ranger District of the George Washington National Forest, during the first week of October, 1975 (Figure 1). This survey, covering 275,932 acres within the purchase boundary of the District, showed that there were 158 individual spot infestations affecting some 33,075 trees.

This southern pine beetle population is part of a South-wide outbreak involving 13 states. The current outbreak developed on the Pedlar District in early 1973 and has continued at relatively high levels of infestation until this time.

METHODS

Standard aerial sketchmap procedures were used in this evaluation.[1/] Data from the 50 percent aerial sketchmap surveys were expanded to represent 100 percent coverage and corrected for observer error. Five spots containing 1,093 red and fading trees were examined to determine the cause of mortality, number of beetle-killed trees, number of currently infested trees, and condition of the brood.

1/ Detection of Forest Pests in the Southeast. 1970. USDA, USFS, SA, S&PF, Div. of FPM, Pub. S&PF-7, Atlanta, GA. 51 pp.

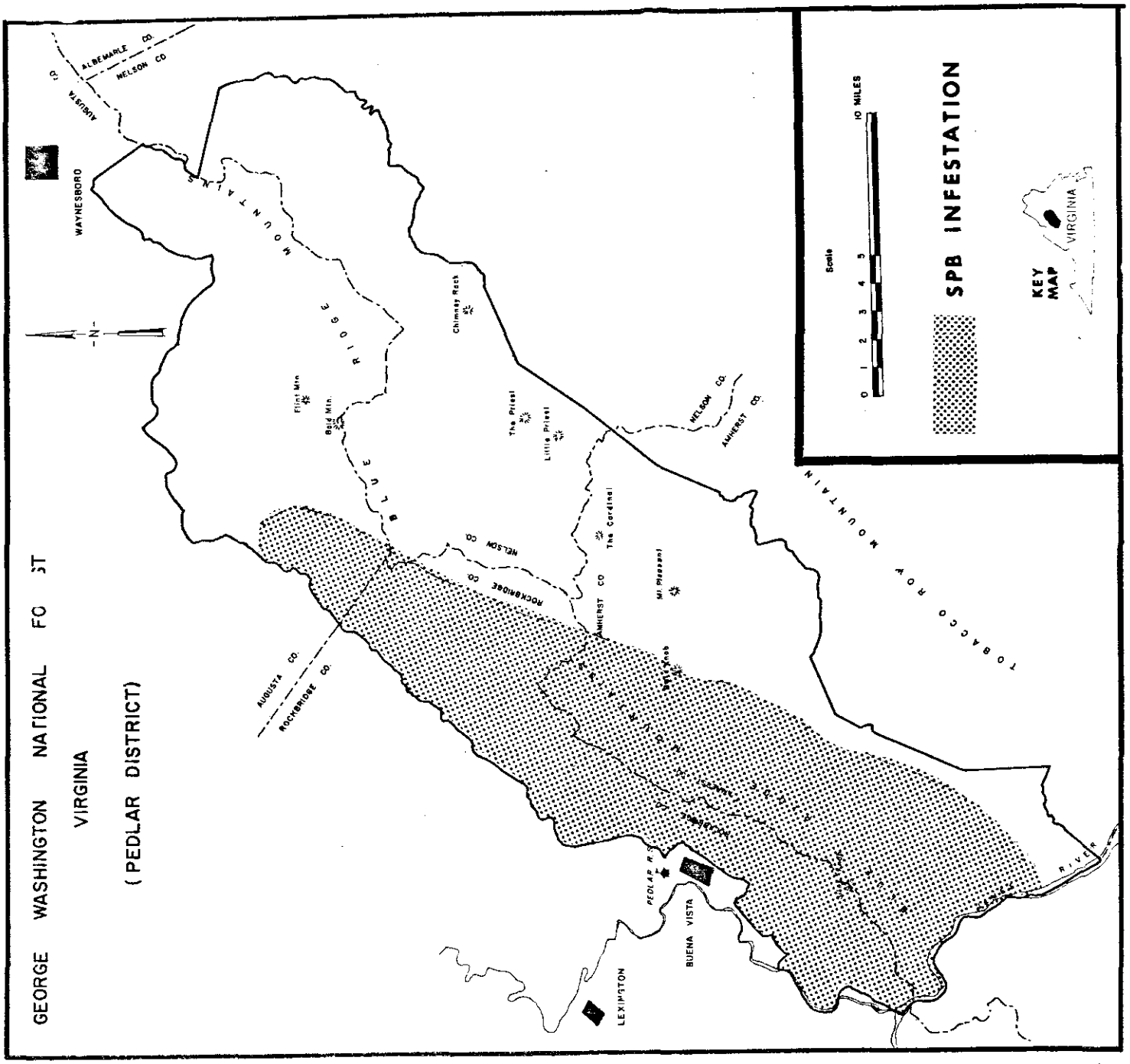

Figure 1. Area of southern pine beetle outbreak on the Pedlar Ranger District, George Washington National Forest, October 1975.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

Figure 1 shows the portion of the Pedlar District with southern pine beetle infestations. The survey data is summarized in Tables 1 and 2. This data indicates that the beetle population has decreased somewhat. Last year in October we reported some 78,000 infested trees as compared to approximately 11,000 found during this survey. However, going into the winter with 11,000 currently infested trees also indicates a potential for possible continued activity the remainder of this fall and in the spring of 1976.

RECOMMENDATIONS

The southern pine beetle outbreak is expected to continue at a relatively high level on the Pedlar District in 1976, unless natural factors intervene. However, this is not likely and a suppression program could substantially reduce tree mortality if executed properly. Infestations can be stopped in individual stands by using methods outlined in the 5250 section of the Forest Service Manual which are as follows:

Table 1. Summary of aerial and ground data for the Pedlar District, George Washington National Forest.

	Ownership Unit Pedlar Ranger District
1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Sketchmap
Date of aerial survey	9/29/75
Total acreage surveyed (National Forest only)	141,351
Total susceptible host type (on National Forest)	23,760
Total number of spots within the survey boundary	158
Spots per M acre of host type	6.7
Average spot size (trees)	140
Range of spot sizes (trees)	1-5000
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	10/2/75
Infested trees per M acre of host type	483
Total number of infested trees within the survey boundary	11,467
Ratio of green infested to total red and fading trees	1:3
Total volume of infested trees	135,311
Total volume of affected trees at the time of this survey	390,285

Table 2. Summary of aerial survey data - Pedlar Ranger District, George Washington National Forest, September 29, 1975.

Ownership	Infestation Size (# Trees)										
		2-5		6-20		21-50		50+		Total	
	Singles	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees
Pedlar R.D.[1/]	22	14	55	40	505	46	1900	36	19,564	158	22,050

1/ Corrected according to data by Aldrich et. al. (1958); expanded to a 100% survey area coverage.

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

   Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

   The order of priority for removing beetle infested timber from a spot should be as follows:

   Trees having nearly developed broods (usually the red and fading trees).

   Trees having young broods (usually the green, recently infested trees).

   Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.

3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel.)

   Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

4. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated within two or three weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your handsbecome contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.